

REMARKS

Claims 1-10, 12, 13, and 23-32 are pending in the subject application upon entry of the amendments and new claims. Claim 1 has been amended to disclaim the cited art. Claim 11 has been canceled without prejudice or disclaimer and to expedite allowance of the application. Claims 14-22 have been cancelled without prejudice or disclaimer in view of the Restriction Requirement. Claims 23-32 have been added to further describe certain aspects of the invention. Favorable reconsideration in light of the amendments, the new claims, and the remarks which follow is respectfully requested.

Restriction/Election Requirement

During a conversation between Examiner and Applicant's representative Gregory Turocy on or about January 15, 2008, claims were subjected to the following restriction requirement:

Group I (Claims 1-13), drawn to a desulfurization process, classified in class 208, subclass 213;

Group II (Claims 14-18), drawn to a process for making an adsorbent, classified in class 502, subclass 337; and

Group III (Claims 21 and 22), drawn to an adsorbent, classified in class 502, subclass 406.

Affirmation of the provisional election to prosecute Group I (claims 1-13) is hereby made. It is noted that new claims 23-32 fall within Group I.

Obviousness Rejection

Claims 1-13 stand rejected under 35 U.S.C. §103(a) over Winsor (GB 1,144,498) in view of Kimber (US Patent 5,059,539). Winsor relates to a process for desulfurization of an aromatic hydrocarbon-containing fraction. Kimber relates to a method of testing a heterogeneous or homogeneous catalyst.

Claim 1 recites "***a rate constant for tetralin hydrogenation activity at 150 °C is less than 0.01 l/s.g cat and wherein in an adsorbent a part of the nickel is present in the metallic form, wherein the nickel adsorbent comprises an oxide of a metal that forms stable sulfides under the conditions applied in the process for the removal of contaminating sulfur compounds from hydrocarbon feedstock.***"

The Office Action concedes on page 6 that Winsor fails to teach or suggest a nickel adsorbent further containing a metal oxide. The Office Action, however, contends on page 6 that Winsor teaches using cobalt and molybdenum oxides for sulfur removal in a step before desulfurization with nickel adsorbent. From this, the Office Action concludes that it would have been obvious to one skilled in the art to modify the sulfided nickel of Winsor by including cobalt and molybdenum oxides to arrive at the claimed invention.

It is respectfully submitted that it would NOT have been obvious to one skilled in the art to modify the sulfided nickel of Winsor by including cobalt and molybdenum oxides to arrive at the claimed invention. Winsor merely teaches that other process employing cobalt and molybdenum oxides can be used “**before**” feedstock is desulfurized by Winsor’s process or that Winsor’s process is repeated more than once. See page 2, lines 30-39 of Winsor. Winsor does not teach or suggest that metal oxides are included in a sulfided nickel adsorbent.

Moreover, claim 1 recites the nickel adsorbent comprises an oxide of a metal that forms stable sulfides **under the conditions applied in the process for the removal of contaminating sulfur compounds from hydrocarbon feedstock**. It is unpredictable that a metal oxide can form stable sulfides under the conditions applied in the sulfided nickel adsorbent process. In fact, it is true when Winsor only teaches that other process employing cobalt and molybdenum oxides can be used “**before**” feedstock is desulfurized by Winsor’s process.

The Office Action concedes on page 6 that Winsor fails to teach or suggest that a part of nickel is present in a metallic form. The Office Action, however, contends that “[o]bviously, Winsor invention uses a part of nickel in metal form” because Winsor teaches “a partially sulfided nickel contact material (See page 4, lines 7-15) showing high sulfur capacity, prolonged activity (for 1300 hours) and substantially no hydrogenation activity (See page 4, lines 21-27).” From this, the Office Action concludes on page 6 that it would have been obvious to one skilled in the art to modify the teaching of Winsor to use a part of nickel in the metallic form to arrive at the claimed invention.

It is respectfully submitted that it would NOT have been obvious to one skilled in the art to modify the teaching of Winsor to use a part of nickel in the metallic form to arrive at the claimed invention. As the Office Action concedes, no where does Winsor

teach or suggest a sulfided nickel adsorbent with a part of nickel in a metal form. Moreover, it is respectfully requested that the Examiner identify a factual support in Winsor that obviously teaches a part of nickel of sulfided adsorbent in metal form.

The Office Action concedes on page 6 that Winsor fails to teach or suggest a rate constant of adsorbent for tetralin hydrogenation activity. The Office Action, however, contends that "[o]bviously, supported nickel in the Winsor process has very low value of the rate constant." The Office Action further contends that a "rate constant for hydrogenation activity for an adsorbent or catalyst is a property which can be easily determined (as evidenced by Kimber et al, US Patent 5,059,539; column 1, lines 49-68; column 2, lines 1-38)." From this, the Office Action concludes that "it would have been obvious to one skilled in the art at the time the invention made to modify Winsor invention and determine the tetralin hydrogenation activity for the adsorbent used in the invention" and that "[i]t is expected that the rate constant in Winsor invention will necessarily be in a range as claimed by the Applicant."

First of all, Kimber relates to a method of measuring a hydrogenation activity for **a heterogeneous or homogeneous catalyst** used in a reversible hydrogenation reaction e.g., for the production of coal derived liquids. See column 1, lines 4-8 of Kimber. Kimber does not relate to a method of measuring a hydrogenation activity for sulfided nickel adsorbent. Therefore, it would NOT have been obvious to one skilled in the art to modify Winsor invention and determine a tetralin hydrogenation activity for the adsorbent of Winsor.

It is further respectfully submitted that it is NOT expected that the rate constant of Winsor's sulfided nickel for tetralin hydrogenation activity will necessarily be in a range as claimed by the Applicant. No where does Winsor teach or suggest a rate constant of Winsor's sulfided nickel for tetralin hydrogenation activity. A rate constant of Winsor's sulfided nickel for tetralin hydrogenation activity may or may not be in a range as claimed. The probability of such characteristic, however, is not sufficient to establish the inherency of that characteristic.

It is well established principle that inherency must be a necessary result and not merely a possible result. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) and MPEP §2112 IV. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support

the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Id.*

In view of the foregoing, the proposed combination of Winsor and Kimber fails to teach or suggest all the features of claim 1. As a result, the combination cannot render claims 1-10, 12, and 13 obvious. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 3 recites "*a nickel surface has an atomic S to Ni ratio of **at least 0.5**.*"

The Office Action contends on page 7 that "Winsor invention discloses atomic S to Ni ratio of at least 0.75 (See page 1, line 78)."

It is respectfully submitted that Winsor teaches that an "**upper limit**" of sulfur-nickel ratio is 0.2:1. See page 2, lines 1-3 of Winsor. Page 1, line 78 of Winsor merely teaches that if Winsor's nickel will continue to absorb sulfur, the nickel contains sulfur up to a ratio of 0.75:1. Therefore, Winsor fails to teach or suggest a process for removal of contaminating sulfur compounds involving a sulfided nickel adsorbent, wherein the nickel surface has an atomic S to Ni ratio of at least 0.5. For this additional reason, Winsor cannot render claim 3 obvious.

Even if a *prima facie* case of obviousness is established, which is not conceded, the following experimental data demonstrates that a process in accordance with the claims has superior and unexpected properties compared to processes outside the scope of the claims. In particular, the experiments compare percentages of conversion of DBT to stable sulfides and conversion of 4,6,-DMDBT to stable sulfides with a process involving a sulfided nickel adsorbent containing a metal oxide and a process involving a sulfided nickel adsorbent lacking a metal oxide.

DBT conversion and 4,6,-DMDBT conversion with a sulfided nickel adsorbent containing a metal oxide and a sulfided nickel adsorbent lacking a metal oxide were measured at temperatures from 175 °C to 250 °C. The sulfided nickel adsorbent containing a metal oxide contains 31 wt. % nickel on silica, mixed with 30 wt. % zinc oxide. The sulfided nickel adsorbent lacking a metal oxide contains 56 wt. % nickel on silica.

Fig. 1 is a line graph that summarizes DBT conversion with the sulfided nickel adsorbent containing zinc oxide (*i.e.*, line with diamonds) and DBT conversion with the sulfided nickel adsorbent lacking a metal oxide (*i.e.*, line with circles). Fig. 2 is a line graph that summarizes 4,6,-DMDBT conversion with the sulfided nickel adsorbent

containing zinc oxide (*i.e.*, line with diamonds) and 4,6,-DMDBT conversion with the sulfided nickel adsorbent lacking a metal oxide (*i.e.*, line with circles).

Figs. 1 and 2 indicate that the sulfided nickel adsorbent containing a metal oxide in accordance with the claimed invention has significantly higher percentage of conversion than the sulfided nickel adsorbent lacking a metal oxide. Superiority of a property is evidence of nonobviousness. See MPEP §716.02(a). For this additional reason, the cited art cannot render the claims obvious.

If necessary, the experimental data will be included in a Declaration and the Declaration will be submitted under 37 C.F.R. § 1.132.

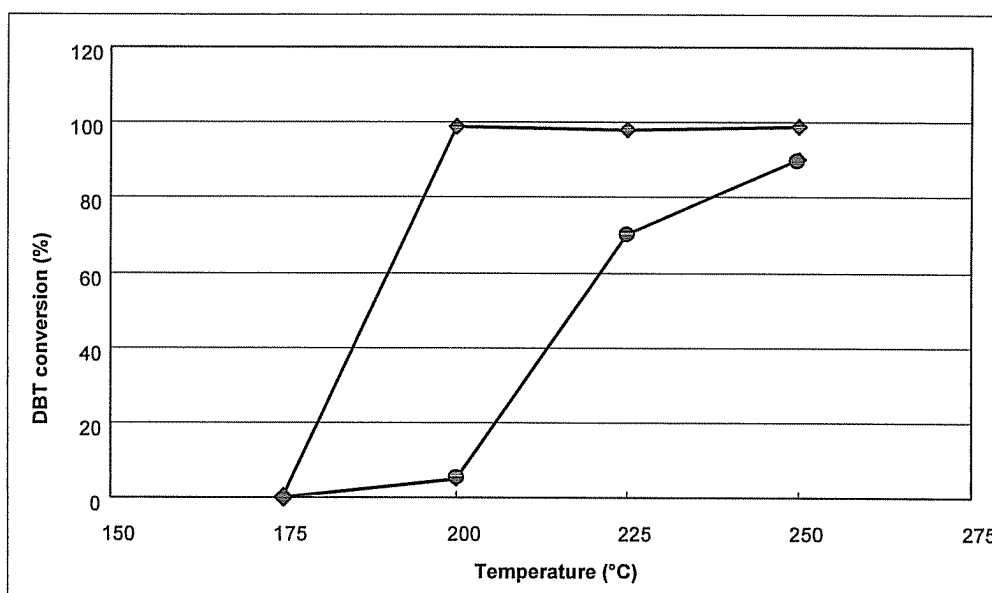
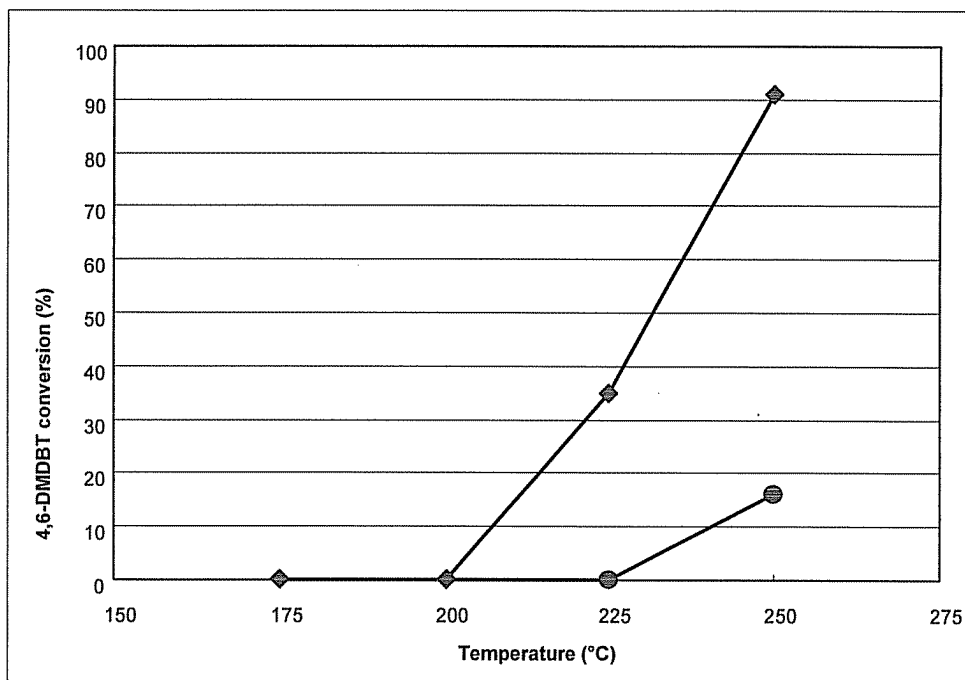


Fig. 1

**Fig. 2****Petition for Extension of Time**

A request for a three month extension of time is hereby made. Payment is being made through the EFS electronic filing system.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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